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# ICT ADOPTION BY ICT SMES IN THE UK WEST MIDLANDS – IS EDUCATION THE KEY?

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## **Abstract**

*The West Midlands (WM) ICT industry is one of ten sectors identified by the regional development agency, Advantage West Midlands (AWM), for clustering development. AWM is investing resources to fund projects that will meet the needs of industry in encouraging development of clustering activity and the growth of the ICT Cluster, including helping companies to adopt new technologies. During 2007 as part of a PhD study, research was commissioned by AWM which involved 200 ICT SMEs in the West Midlands (WM) UK. This work indicated that common misconceptions are as endemic in ICT companies as in any other sector. This research is unique in that it targets one sector only which has often been assumed not to need support in ICT adoption. This paper concentrates specifically on the micro company owner-manager's education and skills. Whilst owner-managers have a major influence on ICT adoption in other sectors; in the ICT industry adoption and diversification are necessary at an alarming speed, the implications of this influence are not only on the micro company itself but are far wider-reaching. Consequently, this research has identified specific educational concerns with regard to owner-managers and technology adoption.*

**Keywords:** SME, Adoption, Education, Owner- Manager, ICT

**TRACK:** IS in Business and Organisations: Diffusion of Innovation

## **1. Introduction**

The Bolton Committee was formed in 1970 to examine the role of small companies in the UK economy. This committee was set up in spite of the opposition to it which stated that small companies were of little consequence in the world economy (Culkin and Smith 2000). The conclusion the committee reached raised more questions about the role of small companies than it solved. It was therefore recognised at that point that the rate of market share for small companies in the UK was in faster decline than in any other developed economy (Bolton 1971). Since this small companies have been of interest to both political parties and researchers. There have been many discussions over the importance of this sector to the economy although there is evidence to suggest that small firms do play a major role in the world economy (Hill and

McGowan 1999, Timmons 1994) and that they constitute the bulk of enterprises in all world economies (Storey 1994).

The definition of an SME for this research was determined according to the EU definition. However, the best description of a small company is that used by Bolton (1971) who states that a small firm is “an independent business, managed by its owner or part owner and having a small market share”. However, the discrepancy in the term SME adds complication to this as a small business can be very different in terms of this description, not all being totally independent and not all having a small market share. Much IS research has concerned large organisations although SMEs and their use of IS/ICT have been a focus of attention for others (Ballantine 1998, Dans 2001, Duhan 2000, Kingswell 1999 and Levy et. al 1998, 2000). SME research is crucial as they form a very important part of UK and EU business and have the ability to impact in a major way on customers and suppliers. In fact 99.3% of UK small businesses have less than 49 employees (BERR 2006) and the average size of 98% of all firms across the European Union (EU) are identified as having seven employees and are termed 'micro-enterprises' since they employ less than 10 people and in the UK, an average micro company is around six and eight employees. (Martin and Halstead 2004).

Dans (2001) stated that SMEs pose a very difficult area of research, as the world in which they operate is unpredictable. However, SMEs form a distinctive part of the industrial landscape of the UK, with most having quite divergent qualities. On the positive side they are agile and can adapt quickly in the way they work, decisions can usually be acted upon quickly; they have proximity to their markets and significant customer loyalty (Reece and Costello 2005). Bergeron and Raymond (1992) stated that these same characteristics affect the adoption of ICT in SMEs. In particular, lack of resources and the dependency on a few key individuals were cited as key issues. Especially as companies often support the supposition that the potential to adopt ICT can be found throughout the whole of an SMEs operations.

## **2. West Midlands (WM) ICT Cluster**

Since the demise of UK Online, e-skills UK is the only entity playing a national role in the ICT policy arena. Although, the British Computer Society (BCS), National Computer Centre (NCC) and Intellect support their work they are all membership based organisations focusing mainly on large organisations. There is currently no national level strategy to increase adoption of ICT by SMEs.

Advantage West Midlands (AWM) is one of nine Regional Development Agencies (RDA's) responsible for delivering economic advantage to the UK's regions. AWM's Agenda for Action (2001) defined business clusters as one of their delivery mechanisms. In fact the clusters are the only mechanism in the WM which concentrates on industry sectors. The development of clusters was first described by Porter (1990) in which he described a cluster as a group of "Interconnected companies specialised suppliers, service providers and associated institutions. As clusters are groups of companies who are linked through their activity; it is usual for these companies to be located in the same area. The connection between companies in a cluster can be both vertical via the supply chain and horizontal through complimentary products or services. Most will also involve social networks that can also produce benefits for the companies involved. Clusters may consist of companies, suppliers, service providers, related industries, and associated institutions (for example universities, agencies, and trade associations) in a particular field that may compete but also co-operate with each other. (Porter, 1998)

Academics and governments have previously attempted to address the issue of increasing efficient adoption of ICT and this issue is gathering pace in the WM fuelled by the work of Sheppard and Hooton (2007). Their work determined a strong causal link between efficient and effective technology adoption and increases in GVA. Gross Value Added (GVA) measures contribution to the economy of each individual producer, industry or sector in the United Kingdom. In fact their research found a direct correlation between computer *use* and profitability in organisations.

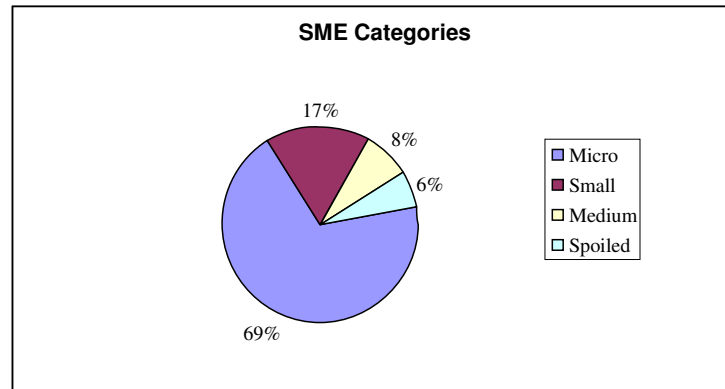
Sheppard & Hooton (2007) report commissioned by eSkills UK provided forecasts of the economic impact of ICT on UK's regional economies. The paper claims that the potential economic impact, if ICT is optimised, would be significant for all UK regions. They estimate potential achievement of between three to four percent in productivity savings; which could equal between one up to five billion pounds per region. They further expect the scale of impact could be even greater as new technologies and capacities open up unforeseen opportunities. The report forecast that the WM region demonstrated a gap in GVA of £10b when compared with other UK regions. It also highlighted that a 10% increase in productivity affected by successful and efficient adoption and use of ICT could reduce that gap by £3b. This issue is replicated across the UK when latest statistics produced for the government by London School of Economics (2005) shows that productivity gains are identifiably associated with widespread use of computers by employees within firms.

The challenge is clear and there is a specific need to target ICT companies who would be expected to be ready to help meet that challenge. The WM are not the only region facing these challenges with southwest London and Thames Valley areas being one of the most productive regions of the UK yet reporting similar concerns (Harindranarth et. al. 2007)

The ICT Cluster in the West Midlands represents some 72,000 employees and more than 3,000 SMEs. If AWM could identify the factors involved in successful adoption and implementation of technology it would be a significant aid in the development of the cluster. Firstly, by identifying whether companies who have ICT as their core business have the same factors affecting adoption as other businesses and secondly by identifying the factors important to their market it provides valuable market analysis. Levy et. al (2005) state that industrial sector has no bearing at all on the Internet adoption process. Information about the drivers for ICT adoption amongst their SMEs would prove invaluable to the ICT cluster.

### 3. Methodology

This research used both quantitative and qualitative methods in order to capture data to identify trends whilst also investigating the rich environment in which the ICT Cluster SMEs operate. Specifically, the research used questionnaire and interview methods to conduct its investigations on the three SME categories located in the West Midlands.



**Figure 1: Proportion of SME categories involved in the study**

The latest information from the ICT Directory Project (2008) which maps the ICT companies in the WM shows 72% of companies as having less than 10 employees. This survey recorded the company background, the existing infrastructure, the IT investment they had made or intended to make, and business performance as a result of investment. The study interviewed approximately 200 West Midlands ICT businesses of which 167 had less than 10 employees. The study was conducted through face-to-face (83%) and telephone interview (17%). Here the results from the questionnaire appertaining to the education and knowledge of the owner-manager with regard to ICT are explored the micro companies only (less than 10 employees). Managers of smaller sized firms are believed to be very influential (Damanpour and Schneider, 2006). Indeed micro companies are often orchestrated by a dominant owner with centralised authority (Schein, 1983; Poza et. al. 1997; Sharma, 2004). They usually establish a paternalistic culture and challenges to this authority are virtually unheard of (Sharma, 2004). The personal characteristics of this owner-manager will to a great extent influence the organisational culture (Damanpour and Schneider, 2006; West and Anderson, 1996).

During the survey the perceived benefits were explored both pre and post implementation. This was done by asking respondents what the perceived benefits were and then asking what measures of adoption success (evaluation) were in place. In this survey it was considered vital to explore this element as the lack of evaluation within SMEs often relates to their lack of strategy (Levy 2005). This means that often no planning is done prior to adoption and no evaluation is done post adoption which may mean that SMEs operate in handcuffs and blindfolded. Not having the advantage of planning associated with the business plans and related to changing markets and not having the historical data to learn from mistakes.

Personal factors in this survey were deliberately kept to a minimum as this was not intended to be a study which took on broad spectrum of issues surrounding the ability of the owner-manager to make investment decisions and associated psychology and/or management studies; particularly since previous research has already emphasised the importance of the owner-managers' perception, education and beliefs in the IT adoption process (Merhten 2001, Rashid and Al-Qirim 2001, Levy and Powell 2005, Storey 1994, Van Akkeren et al 1999b). It was therefore a deliberate decision to base the personal factors on the two most significant issues taken from previous theoretical models, and these were educational experience and knowledge of IT.

#### **4. Adoption and Owner-Manager Education**

Van Akkeren (1999a) states SME owner-managers have significant influence on ICT adoption and success rates. It is this owner-manager's 'perception' of the value to the company that is often either the inhibitor or the driver for the adoption. Previous models have looked at 'perceived usefulness' and 'perceived ease of use' of a specific ICT investment. 'Perceived benefits' has been used more recently in surveys (Harindranath 2007) and in this context this research attempts to broaden this concept to 'perceived value' to give a broader perspective and attempt to capture more than just the one aspect. Although this split of owner-manager characteristics and firm characteristics is divided in the work of many researchers it is often not as easy to define lines between these areas. For example the SME sophistication may be due to

the owner-manager or the level of technology within the firm already. As the organisational readiness can be as much linked to the strategy or lack of strategy in the company as it can be to the owner-manager attitude to adoption

.  
In Storey's (1994) longitudinal study education was found to be the most important factor as a proxy for growth amongst the 15 owner issues that he uncovered. Storey speculates that this may be as the higher level of education gives the owner more confidence when dealing with all business issues. If this is the case then all aspects of business would be affected and not just business growth. This supposition is further supported through work in other fields regarding small and micro companies including research into adoption (Levy 2005, Van Akkeren 1999b, Cooper 1994). In fact, Cooper (1992, 1994) claims to have found a positive relationship between education and firm performance. Research by De Clercq and Arenius (2003) demonstrated that education impacts positively on the likelihood of starting a new business and felt that this was mainly as it gave their respondents confidence in their entrepreneurial ability. However, holding a post graduate degree did not have the same effect as having an undergraduate degree. There is very little work regarding the impact of formal versus informal education within the adoption literature and as such this work draws on the business community research into growth and innovation. It could be assumed from this that that all business activities have the potential to be impacted powerfully by the education of the owner-manager, especially in an environment with less than 10 employees.

In work carried out by Reece and Costello (2005) it was found that only one company aligned their IT to their business strategy. They argued that this was due to the IT educational background of the MD, which gave him the focus to ensure ICT had a significant role within the business strategy. Thus, demonstrating once more that the knowledge and education of the owner-manager is a major influence in the adoption scenario. It is often an owner manager's attitude and experience which is affected by their educational background that can influence significantly the role that ICT takes within the company too (Duhan et al 2001). Thompson et al (2004) carried out technology transfer over the course of three years and established in that work that although projects of that nature were of enormous benefit to many small companies, most needed further guidance, support and money to fully achieve any success with



new technologies. Most SMEs involved in their work felt that one of the greatest benefits achieved was the education in the capabilities of the new technologies and advice about its use.

Can this educationally induced confidence support companies as they attempt to keep abreast of technology trends through strategic adoption which often proves to be a difficult challenge for larger organisations? In the ICT sector this problem is exacerbated as new technologies and trends hit the market at an alarming rate and they are often seen as the trend setters. Keeping abreast of technologies to keep their own product and service range relevant is difficult but using the technologies to give themselves a competitive advantage is an area thus far unexplored.

Chesher and Skok (2000) attempted to develop a roadmap for business to adopt technology and also found in their work that SMEs see IT as a success if it enables them to 'stand out from the crowd'. They also found that amongst the main factors influencing the adoption of IT were the educational level and age of the business owner.

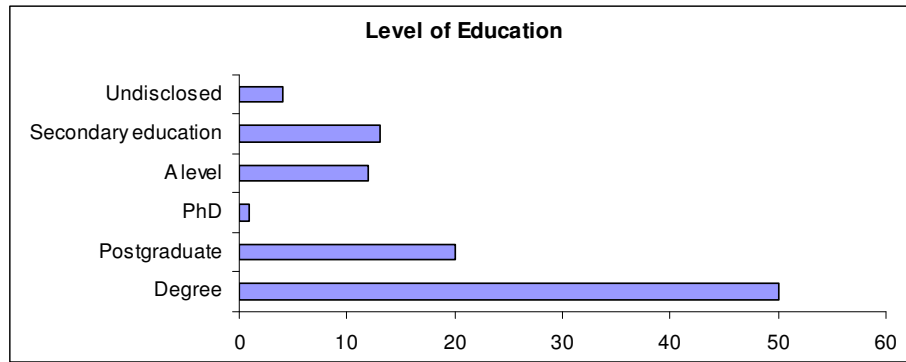
The literature clearly establishes that the owner-managers educational attainment would need to be a factor in any work regarding adoption and both the owner manager's education and their knowledge of ICT would be an important consideration in adoption success. It would seem pertinent, therefore, to place this issue in a new model development. Although it has been established that the education of the owner-manager may be paramount for successful adoption and growth in micro companies, the lack of education of the owner-manager can have the opposite effect. This is seen in work by Martin and Halstead (1994) who report that the early educational experiences of an owner-manager may impact on his attitude to training for his employees too.

## **5. Findings**

A subset of the findings from the main survey is presented here but particular the educational attainment and knowledge of IT of the owner-manager of the micro companies. This is examined against the company turnover, the perceived benefits and the measures of success in the companies. Storey (1994) identified from eighteen studies, fifteen characteristics of the entrepreneur, of these seven of the studies had identified education as an important factor in growth of small companies, thus identifying education as the single biggest influence. There was a dichotomy as to whether the greater knowledge facilitated the development of greater knowledge or simply more confidence in dealing with customers and suppliers. Since growing companies often need to adopt technology at a faster rate both to cope with a growing infrastructure and a growing market (Levy 2005); the educational attainment of the owner-manager is seen as being imperative in this study in order that relationships between this element and other issues such as turnover can be examined. Also, Mehrten et. al. (2001) stated that if the CEO is innovative and knowledgeable about IT then adoption was more likely to be successful this was previously discovered by Van Akkeren et.al (1999b). As often the perceived benefits to the company are perceived by the most influential individual in the company, the owner-manager, then it is paramount that they have enough knowledge of ICT to either, make the decision themselves or recognize their lack of knowledge and seek appropriate advice

### **5.1 Level of Education**

The majority (approximately 96%) of the respondents were the owner-managers of their companies. There was a predominance of micro owner-managers educated to at least a first degree level in this sector. That is, 50% of the owner-managers are first degree holders, 20% hold postgraduate qualifications. 27% have 'A levels', secondary school education or have attended a course in the college, 1% of the owner/managers hold a PhD. This means that the ICT sector as a whole is well educated formally (see Figure 2).



**Figure 2: Level of education of owner-managers.**

The findings show that, among the postgraduate holders involved in the entire study, 81% were from Micro companies. This may indicate that in this sector in order to start a company a high level of education is a supporting factor. This study did not examine the reasons for this but further work could be indicated.

Of those micro owners-managers who acquired their profession through formal education their degree specialism was either in computer science (68%) or from electrical and electronic engineering fields of study (32%). None of those formally educated claimed to have received that education through a combined degree such as Business and IT.

## **5.2 Knowledge of IT**

As the majority of companies in the ICT Cluster had an owner-manager who was educated to degree level or above, the interviewee was asked about the presence of IT Professionals within the company. This question referred to either the presence of someone who had been formally educated in IT and had achieved that through the completion of an IT related degree; or those who had achieved their knowledge of IT through experience i.e. self taught on the job. The latter may show that there is an enthusiasm for IT and therefore the presence of an IT champion but may not necessarily indicate the correct skills for making IT investment decisions. In 97% of the cases this was the owner-manager and this influences the adoption significantly.

Most owner-managers in this survey who claimed to be an IT professional had acquired that IT knowledge through experience, and not through formal educational routes. That is, 68% of micros involved in the study claimed to be IT professionals. 23% of those who claimed to be IT professionals had acquired their knowledge through formal education, while 53% had obtained it through experience, 24% did not disclose.

Of those who acquired their profession through experience rather than formally, their educational background was from other areas including: Business Administration, Business studies, financial management, Chartered accountancy, Mechanical engineering, Automotive engineering, Quality engineering, Neural science, Genetics, Physics and applied physics, politics, education etc. So altogether the ICT Sector is well educated but in the majority of cases this was in other specialist fields.

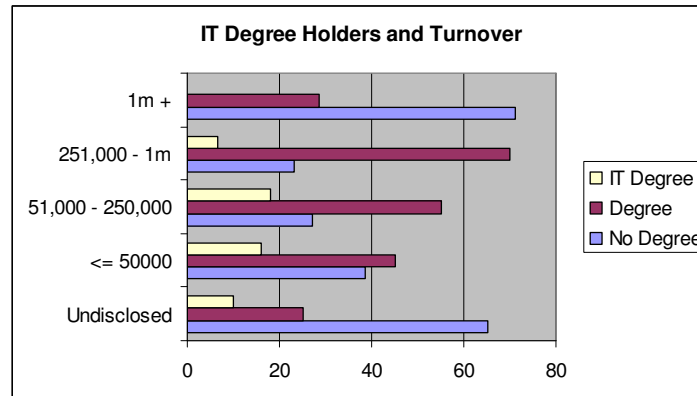
### **5.3 Education vs Turnover**

Further analysis was carried out to understand if there was any correlation between the turnovers of the micros who claim to have an IT professional, compared to the ones who do not employ one.

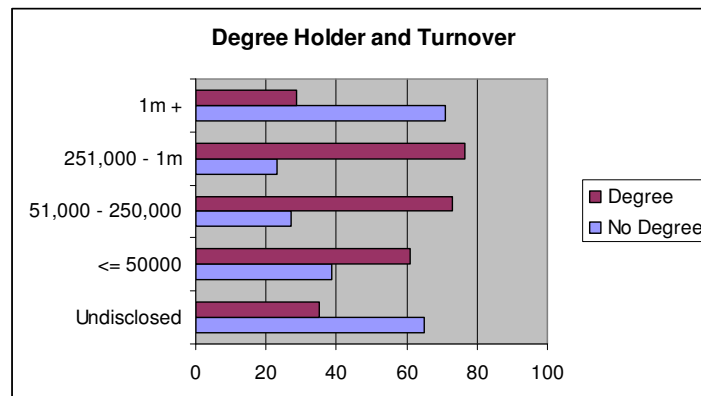
The knowledge of IT of the owner-manager is paramount in the success of adoption in the same way as the success of the company as a whole (i.e. increased turnover) is related to the formal education of the owner-manager. This led to the need to examine the relationship between the success of the company in terms of turnover against the education of the owner-manager and whether that education was an IT related degree or not.

Figure 2 indicates that there may be a correlation between those with an education in IT and turnover. However this is not as strong as the correlation between owner-managers who claim to be an IT Professional either acquired formally or through experience, as compared to those who do not (Figure 3). This is particularly pronounced in the category £51k to £250k. Although addressing this factor alone is not enough for the SMEs to become competitive; as companies need other business aspects addressed too, such as using their IT infrastructure to *support* the business.

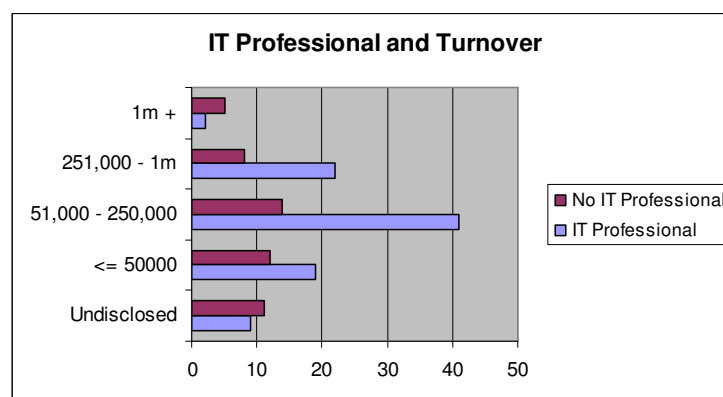
The findings do support the fact that an owner-manager with a formal education enables a more successful business when success equals turnover (Storey 1994)(Figure 4).



**Figure 3: The relationship between IT degree and turnover**



**Figure 4: The relationship between degree and turnover**



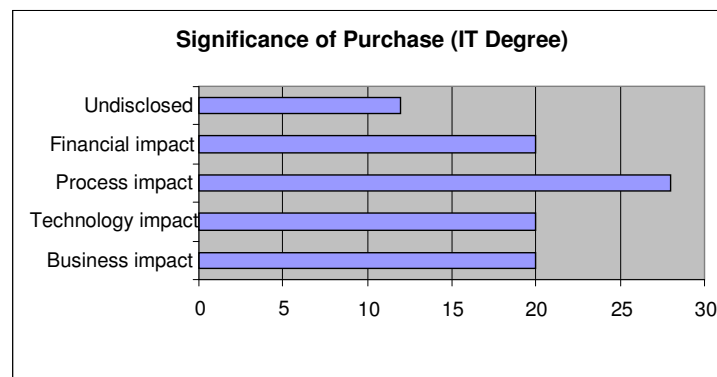
**Figure 5: The relationship between IT Professional (formal and informal) and turnover**

In summary, there is some indication that companies who claim to have IT professional skills in house have a higher turnover than those companies who have no IT professional. This is not clear cut as there are many other factors too, including the sub-sector that these companies operate in since some IT companies have very large turnovers in comparison to number of employees.

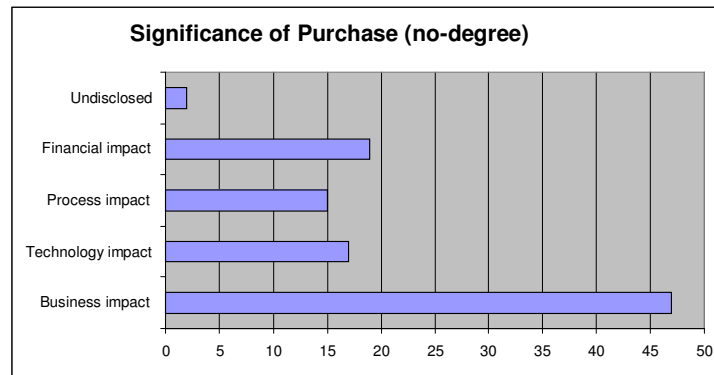
### 5.3 Perception of Value

This study asked micro SMEs to consider their last three investments and to choose the most significant of those. They were then asked if this significance was perceived as financial, process, technological, business impact or other. The reasoning behind this was seen as:

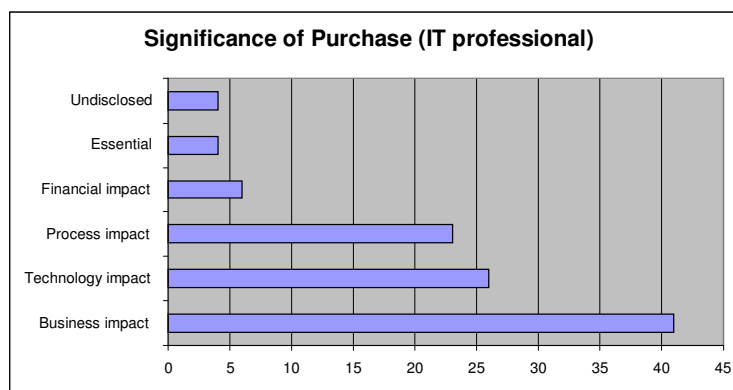
- Financial impact may indicate that the investment is viewed as a cost.
- Process impact may indicate their lack of skill at business process mapping or attempting to adopt technology without underlying changes to processes.
- Technological impact may indicate a major upgrade with compatibility, data transfer implications etc. or simply lack of IT skills.
- Business Impact may be broken into several areas and those that indicated this were asked to expand their answer.



**Figure 6: Significance of IT investment (IT Degree)**



**Figure 7: Significance of IT investment (no degree)**



**Figure 8: Significance of IT investment (IT professional)**

Although in the latter two (Figures 9 and 10) business impact appears to be the largest category. Where the formal education of the owner-manager is in IT (Figure 8) the outcome is very different with a much more even spread of results across the categories. This could be interpreted not as the IT degree holders being educated in the application of IT but the other categories show a lack of understanding of the significance of the purchase with everything construed as ‘having an impact on the business’.

In the latter case there is a possibility that there is a lack of understanding of process driven ICT as opposed to business driven. Most micro companies who answered with ‘business impact’ when asked to elaborate stated that the investment would provide their business with:

- better communication and customer demonstration facilities
- enhanced efficiency
- a wider range of services
- speed in producing software and solving customer business problems
- equipment that was viewed as fundamental to running the business or providing services.

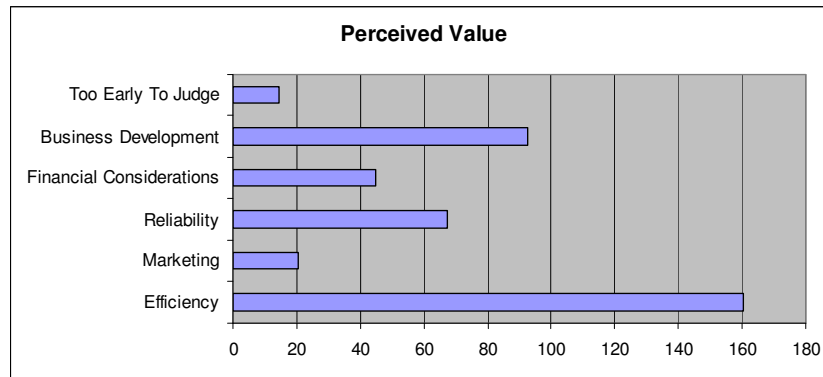
Replying with similar statements to those given regarding the benefits of the purchase (see below) indicating that there is a link between the benefits and the significance to a micro company.

Those micros who considered technological impact to be a significant influence on their investment were mostly those companies who worked as consultants, software designers and/or developers. These type of companies need to stay ahead by investing in the latest technology in order to learn and understand it before they advise their customers. There were also a significant number of micro companies who believed that investing in technology provided them with speed and efficiency in producing their products and other services for customers. This was also classified as having a business impact by those companies.

Although this aspect of ICT adoption cannot be measured quantitatively, a non-rigorous quantitative measure was used to understand how SMEs perceive the success of their purchase (Figure 9). Many SMEs believed that mobility provided them with an efficient means of doing business. These companies mainly invested in laptops, handheld devices, and servers (which allowed them to access information remotely) and other operational technology. Others considered their purchases as 'essential to their business', in much the same way as previously (interpreted here as business development). This may include new employees, training, etc. Marketing was a consideration for others and this included 'better interface with the customer'. Financial considerations were also important with increased turnover, more customers and cost savings noted frequently. Reliability was another reason stated as hardware and software is often upgraded to increase security, storage, access, etc. Just a few companies felt that they could not comment on this aspect as in their opinion their

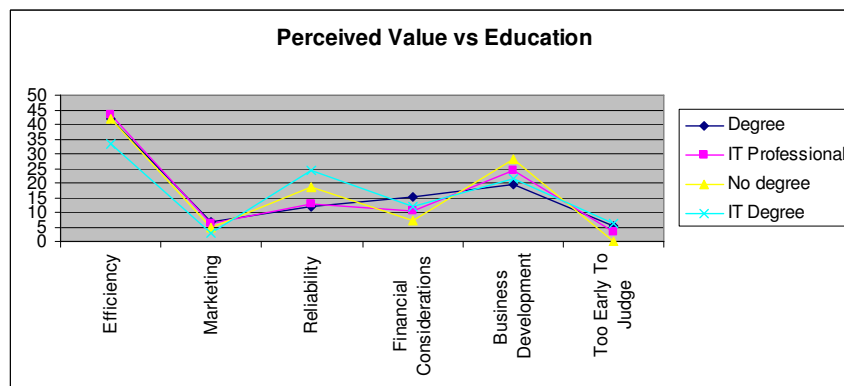


purchases had not completed the set payback period, which indicated that they may measure benefits. However, when questioned further none of the SMEs employed any formal measurement techniques, instead their *perception* of adoption success or ‘instinct’ (Powell 1992) was used.



**Figure 9: Perceived Value of Purchases (Micros)**

Others simply stated that they considered their purchases as so ‘essential to their business’ that they remarked that without investing in IT, they would have been ‘unable to run their business’. This may be a reference to the infrastructure being seen as an underpinning support for the business and not as a strategic investment for growth. The respondents who had given replies which centred on: training, new employees and being seen as more professional, were categorised as ‘Business Development’.



**Figure 10: Perceived Value of Purchases compared with Education (micros)**

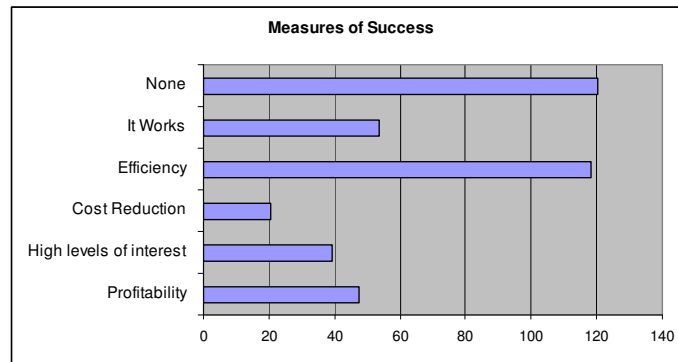
There does not appear to be a correlation between owner-managers who classified them selves as IT Professionals, those who had a formal IT degree or those who had no degree in terms of their perceptions of success (Figure 10). Although the slight emphasis on reliability may show that those with IT knowledge or education concentrate on the technical infrastructure more than the business benefits but this is statistically marginal. Efficiency was seen as important to all groups. Overall, micro companies appear to understand that there are benefits attached to investment in IT. The problem which appears to hinder adoption is often related to the cost of technology.

#### **5.4 Measures of Success**

The majority (97%) of micro SMEs do not evaluate purchases or measure the success of those purchases in any tangible way. Instead they rely on ‘gut instinct’ to make a decision as to the implementation success of a purchase. Of the small percentage of micros who did measure the adoption success a single factor was used to measure it, this was not an econometric measure but much more intangible. The measures used by these micros were categorised as follows:

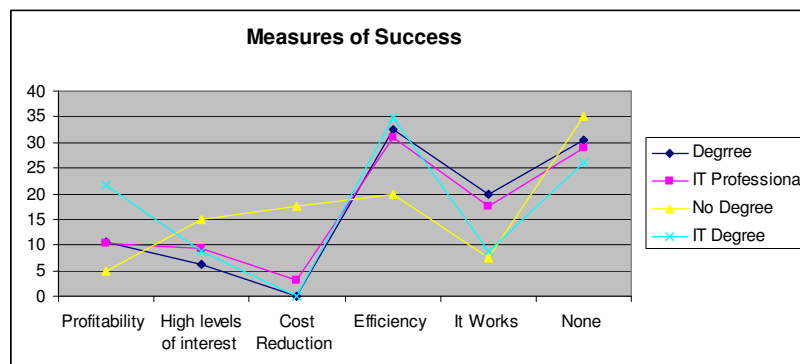
- *Profitability* – Any profit which the company makes as income out of the services it is providing to their customers is measured as a success
- *High levels of interest (more customers)* – some SMEs measure their success quantitatively; by statistically counting the level of interest in their service offering.
- *Cost Reduction* – If the purchase resulted in a reduction of costs for the same services.
- *Efficiency* – Using less time to provide their services
- *It Works* – Was considered a serious answer, as long as the technology is working then it must be a successful adoption.
- *None* – If there is no complaint from the customers which is related to the service provided by a micro SME, then the micro SME may believe that that is a measure of its success. Some just said no we do not measure - “*what a stupid question!*”

This may indicate a gap in knowledge of micros regarding some factors that are important in measuring adoption success as well as lack of understanding of business success. All of these factors can be measured but were not, which reduces the micros ability to use historic data to inform future investment.



**Figure. 11: Measures of Adoption Success**

Figure 11 indicates that by far the largest percentage of answers related to the fact that there was either no measurement or the fact that ‘it worked’ was enough. Efficiency is high on the agenda in terms of adoption success for many micros. This should be no surprise as companies strive to compete. However, the efficiency represented here was not measured in any econometric sense and their inability to see the need to measure any success in a quantifiable and repeatable way will stand in the way of improving the success rate of adoption.



**Figure. 12: Measures of Adoption Success vs Education**

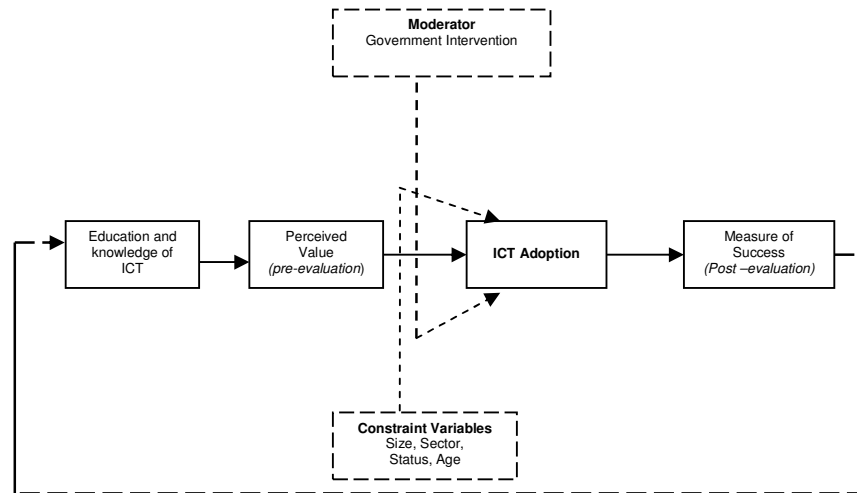
Figure 12 reflects the measures of success implemented by micro company owner-managers analysed according to their educational attainment and whether they considered themselves to be an IT professional or not. All levels of education follow a similar profile and it appears that either efficiency gains or just no measurement at all are favoured by the largest proportion of respondents. Although those with no degree appear to put more emphasis on cost reduction and more customers (high levels of interest). This is a worrying trend and appears to indicate that most micro companies do not measure the value of their IT investment and also confirms the literature which describes this in a number of ways: Farbey et al (1993) "acts of faith", Weill (1990) "blind faith", Powell (1992) "gut instinct".

## **6. Conclusion**

The owner-manager's knowledge and education has been indicated as an essential element in successful ICT adoption. The findings here indicate that in order to be successful in the ICT sector a high level of education may be necessary, although there is no indicator as to why this is. It is suggested that a high technological competence and understanding of advances in this area may be necessary. These findings show that companies who have an owner-manager who is formally educated in IT feel less need to use technology to attract new customers and generally felt less internal pressure stemming from the need to enhance performance. Although other variables may affect this process a thorough grounding in IT will help with evaluation of technology to enhance business growth. There is concern, however, that the reactive approach to the planning of technology investments may also lead to problems. Micro companies were often focused on one set of customers and tried to make technology investments 'fit' their business needs and their customer's needs.

Of real concern is the fact that with no planning prior to investment and no measurement of success post-adoption this leads to the preservation of the perception that ICT is a necessary cost (Levy 2005). It also means that poor experiences lead to poor understanding and these companies do not learn from previous knowledge. The lack of measurement can clearly be seen to impact on the pre-evaluation situation in that owner-managers perceive the main impact of ICT as increasing efficiency. As

this is not measured there is no perception that the last adoption was successful when they approach the next investment situation



**Figure. 13: Educational impact on future adoptions**

The ICT Cluster in the WM would do well to put awareness raising of the need to measure success both pre and post adoption high on their agenda. Figure 13 demonstrates clearly the opportunity to intervene by the government. This could lead to any adoption initiative which supports the adoption process embedding education and awareness raising as part of its remit. Overall the issues arising would indicate a need to address the education of the owner-managers in the need to ensure that their IT purchases are aligned with their business needs. However as most micro companies see their strategy as being the next sale or the next customer this poses a particularly difficult field and business support actions are required by Government on a major scale.

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